DR-26

PYRENE-DERIVED GRIGNARD REAGENT(S): PREPARATION AND USE IN KEY CARBONYLATION/CARBOXYLATION REACTIONS

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Abstract. Among traditional pyrene-containing derivatives, carbonyl/carboxyl compounds are important organic dyes/components, and their photophysical properties have been well studied[1]. Due to the high photoluminescence quantum yield[2] and the ability to form stable donor-acceptor complexes with electron deficient compounds, including nitroaromatic ones[3], pyrene derivatives are used as monomolecular chemosensors for the detection of nitro-explosives in solutions[4]. For the producing advanced materials, for instance based on graphene/graphene oxide, pyrenecarboxylic acid is widely used to develop new methods for the surface functionalization[5].

We have developed the atom-economical synthesis of pyrene-1-carbaldehyde 3, pyrene-1carboxylic acid **4** through 1-pyrenmagnesium bromide (Grignard reagent) derived from 1-bromopyrene[6] with moderate to high yields under mild conditions, as important synthons in order to obtain pyrenecontaining compounds with desired properties(Fig.1).

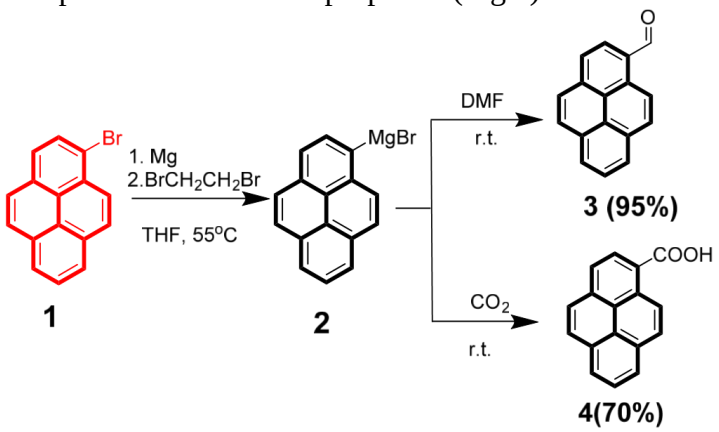

Figure 1. Scheme of synthesis of pyrene-1-carbaldehyde 3 and pyrene-1-carboxylic acid 4

The chemical structures of compounds 3-4 are confirmed by ^{1}H and ^{13}C NMR spectroscopy, mass spectrometric data and elemental analysis.

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